



Sloan Career Cornerstone Center

Profiles of Environmental Engineers



Kelly D. Payne, P.E.

**Project Engineer
HDR Engineering, Inc.
Austin, TX**

Education:

B.S. Civil Engineering, Texas A&M University

M.S. Civil and Environmental Engineering, Cornell University

Job Description

"As a Project Engineer, I work primarily in water resources and systems analysis. My experience includes analysis of large river and reservoir systems, water rights, groundwater/surface water interaction, hydraulic and hydrologic systems, and waste/wastewater system analysis and permitting."

Advice to Students:

"Take an extra technical writing and/org speech communications course in school. It will serve you well in your career."

Video Transcript 1:

"The happy enlightenment for me was when I found a job doing what I was studying. And found out that people actually are -- that the stuff we're doing in school isn't for academic sake, but it's actually happening in the real world."

Video Transcript 2:

"We've got to talk with city councils and we have to talk to river authorities and lay people that don't know engineering terms or the jargon we talk. If I had it to do over again, I would take more technical writing, and more communications presentations type courses, because I've had to develop that on my own rather painfully at work."

Video Transcript 3:

"Be a sponge. Soak up all that you can soak up whether you feel it's really important or not because somewhere down the line it'll come back and it'll help you. Get involved in some activities outside of academia, because there you'll learn how to deal with people, you'll learn personalities are going to clash a little bit, and how to deal with that, before you get into an office where you're one of 30 or 40 people that have to work as a team."

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Video Transcript 4:

"I looked at going into academia and originally went to grad school with that intention, but kind of got a little burnt out on school and I think eventually I will go back and do that. But I chose industry or consulting as opposed to government work because, in my opinion, the -- the consultants get the more interesting work."

Interview:

Payne: Civil Engineers will tell you that coops, internships, summer jobs, or any way to gain experience in the field of your choice, will help you land a first job. More importantly, it will give you a chance to find out what you like to do and are good at doing. The thing I like most about being an engineer is using my skills and knowledge to resolve seemingly unsolvable problems for our clients. The best advice I can offer to civil engineering students is to learn how to be a good communicator. The best designs and problem solutions in the world are worthless if you can't communicate them to your client. Civil engineering is a people-serving profession. Beyond the intrinsic reward of feeling good about your work, there are many varieties of compensation packages. Flexible hours and a family-friendly environment may be worth more than money to you. Everything from profit sharing to retirement benefits, health coverage, and vacation time should be part of your thinking in evaluating a potential employer. The opportunity for promotion and continuing education is particularly important for first-job seekers.

Q: How did you actually get your job?

Payne: My present job is, I'm a project engineer for HDR engineering in Austin, Texas. I got the job through networking with some friends while I was in graduate school, that was part of a job opening here in Austin. And I called them up, told them I was interested and sent them a resume and came down and interviewed and two weeks later I moved to Austin from Ithaca, New York.

Q: When you say networking, what does that actually mean?

Payne: Well, I had some friends that I went to undergraduate school here with at Texas A&M in Texas, and I had some friends that were going to graduate school there and I was up in the Northeast, and wasn't really connected with people in Texas. And so I called up my friends that were in Texas and asked them if they had any job leads that they weren't interested in, and that they didn't mind me taking from them and looking into. And I got a couple of leads and a lead at HDR which turned out to be the job I wanted, and luckily, they wanted me too.

Q: What is it that you actually do on your job?

Payne: I guess day to day I do what would generally be considered water resources engineering. I do computer modeling of rivers and lakes and water rights permits and things like that.

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Q: How does civil engineering play into that?

Payne: Well, civil engineers are generally the ones who compute the hydrology, the quantities of water that are in the river, when someone that wants a new water right. We have to make sure that there's enough water in the river to supply them with water and not harm anybody else who already has an existing right down stream.

Q: What do you use in your job day to day which you might have learned in school?

Payne: The discipline, the hydrology courses that I took, helped me to relate rain fall depths, which are usually measured into runoff calculations -- the water that actually makes it from rainfall into the rivers. And once we've computed the hydrology -- that's called the hydrology for the river. Once we've computed the hydrology, then we know the volumes and the quantities of water and the time placement -- when that water is actually in the river and we can use that with existing water rights and kind of back calculate how much water's available and actually get the water they're interested in without harming anyone downstream.

Q: How does civil engineering play into what's going on here today?

Payne: Well, around us today, we're doing something that civil engineers have been doing for about 20 years, maybe a little more, with the American Society of Civil Engineers, and that's called the Concrete Canoe Competition. Many people will give us funny looks when we talk about Concrete Canoes, but we actually can design concrete that will float and will form into the shape of a canoe. And I daresay, the best canoes -- the lay person wouldn't be able to tell if it's concrete or fiberglass or what the material is.

Q: What are the disciplines of civil engineering that come into play here?

Payne: Well, I guess the specialties in civil engineering that come into play in the Concrete Canoe Competition would be, project management -- the competition is -- part of the goal is to have the students learn how to manage and put together a time line and arrange for delivery of products that they need to build the canoe. There's structural engineering going on because concrete is a structural material, and most of the boats have some sort of a wire mesh or some sort of internal product in the concrete that helps hold it together. And then they're also just learning design ideas. How to take an idea that's on paper and actually go out into the lab and build it and make something that works. So it really pulls together quite a few of the disciplines of civil engineering.

Q: What do you like the most about your job, and then tell me what you like least.

Payne: OK. I guess the most I like -- what I like the most about my job is, when I went to graduate school, I studied water resource systems and environmental systems analysis. And that's basically modeling big reservoir systems, trying to optimize big water and water resource systems. And this job is one of the few in the country, I believe, that actually allowed me, straight out of school, to do exactly what I studied in grad school, which is big basin modeling, and big water resource projects and analyzing those on the computer. What I like least about my job is -- I don't quite get to go outside as much I'd like to. I probably get outside ten, fifteen

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percent of the time in my job, and I like being outside, and I'd prefer it was more half and half. But you take the good with the bad.

Q: How long have you had your job.

Payne: I've been at HDR for four and a half years.

Q: This the first job you got, coming out school?

Payne: It was the first job out of school. I worked during the summers and helped pay for my college -- surveying with a surveying firm in Dallas.

Q: Did you participate in any co-op programs?

Payne: Well, I didn't have a formal co-op where the formal co-ops you miss a semester and work and then go back a semester. But I had pretty much a co-op experience, because I worked for the same engineering and surveying firm for about four summers, and worked up my line each summer, doing a little bit different thing, and learning about the whole business.

Q: How did you become interested in civil engineering and studying it?

Payne: Well, I kind of moved in through the back door. All my life I thought I wanted to be an architect; I thought I was going to be the next Frank Lloyd Wright. And I went to architecture school, and I decided that what I thought and architect was, was really a structural engineer. And so I decided to make the change and get into civil engineering because that's where structural engineers primarily are trained. And I had a professor in civil engineering school then that kind of won me over to water resources. So I kind of came into the water resources and civil engineering through the back door, but I'm really happy with the point at where I am.

Q: What helped you shape your career?

Payne: I guess what really pushed me into civil engineering was a friend of my mother who's a math teacher, her husband worked for this company where I worked surveying and doing engineering during the summer. And she arranged it for me to go down there and just look around and talk to the existing civil engineers and talk about the things that they do. And those things interested me, and when I started studying, I mean going to Texas A&M and studying civil engineering -- I just like it.

Q: I guess I was getting at, where there like books, guidance counselors, resources like that, that the school had that you could take advantage of?

Payne: I guess my mother kind of pushed me towards engineering, because she is a math, a math major, it's probably hereditary, and math and science were always easier for me. And so I always felt like I'd have a career in some kind of mathematics or science. And I liked the civil engineers, because civil engineers, by their very nature, provide services to the public as a whole. Civil engineers -- it comes from being civilian, engineers for the civilians.

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Q: What is it that excites you about the field itself? What's the future of it?

Payne: Well, especially the field of water resources as I'm in, as we all know and we're painfully aware of in Texas at the moment, we've just gone through one of worse droughts on record in the past three years, and water's getting more scarce and more scarce and the people aren't stopping inhabiting in Texas. People are moving to Texas all the time. And so it's going to be real important for us to supply water to those people that are moving to Texas, so we're going to have to come up with innovative ways of using the resources that we have, because the resources aren't getting abundant, so the systems analysis and the systems operation to get -- to squeeze every bit of efficiency we can out of our existing systems, is going to be real important.

Q: Is school like the real world?

Payne: I guess while I was going to graduate school, I kind of had some impressions that what I was doing was pretty academic and wasn't really being applied in the real world. And the enlightenment, the happy enlightenment for me was when I found a job doing what I was studying. And found out that people actually are -- that the stuff we're doing in school isn't for academic sake, but it's actually happening in the real world.

Q: When you were in college was there anything that you wish you had studied or taken when you were a student.

Payne: Yeah. When I was in school, I probably should have taken more writing classes and more communications type classes. I think the biggest problem with incoming fresh graduate engineers is they don't really have good communication and presentation skills. And we can come up with the best designs in the world, but if we can't relay them to people that aren't educated in the specific fields that we're educated in, they're pointless, because we can't make them understand. We've got to talk with city councils and we have to talk to river authorities and lay people that don't know engineering terms and don't necessarily know -- don't talk the talk and the jargon that we talk. If I had it to do all over again, I would have taken more technical writing, and more communications presentation type courses. Because I've had to develop that on my own rather painfully at work.

Q: What other advice would you give to students?

Payne: I guess my biggest advice is to be a sponge. Soak up all that you can soak up whether you feel it's really important or not because somewhere down the line it'll come back and it'll help you to remember. And I would really encourage students to get involved in things like ASCE or TSPE which is the Texas Society of Professional Engineers. There's also a National Society of Professional Engineers. Get involved in some activities outside of academia, because there you'll learn how to deal with people, you'll learn personalities are going to clash a little bit, and how to deal with that, before you get into an office where you're one of 30 or 40 people that have to work as a team. I think we need to have more kind of team building projects instead of sending everybody off to do their own homework by themselves. That's not the way it's -- projects are going to be put together in the real world. You're going to need to work as a team.

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Q: What's a day like for you?

Payne: A day like -- for me -- we pretty much -- our office pretty much works as a team. There are people within that team that have specialties that others don't have. And when those special tasks come along, it's pretty much a foregone conclusion that that person's going to work on that little piece of the pie. I have to know what the others in my in my office are doing on the project, so that we don't double up work. Our money resources are limited and we also need to know so that when we come back together as a team, we can fit the pieces -- the pieces are going to fit with each other, and we won't have square pegs, and that somebody else has drilled round holes.

Q: Could you tell me what a typical day is like?

Payne: Oh, I spend probably 90 percent of it at the computer doing some sort of modeling. I do a lot of modeling in Fortran(PH). Our river basin models are in Fortran code and we're always tweaking them to do some little nuance that we haven't done before. I do a lot of work with spreadsheets and word processors, and things like that. It would behoove, I think, students to learn a good spreadsheet package, because probably 80, -- 75, 80 percent of the calculations we do are on spreadsheets. When it's necessary. I don't work all the time, but in a consulting business, by it's nature, there's limited funds and lots of work. So, there are times when we put in 60 -- 60 hour weeks, and there are times when we put in 45 hour weeks.

Q: You think there's a healthy balance between work and home?

Payne: I strive hard to make it that way. I have a family and two small children that command a lot of time and I feel guilty when I'm not allowed to give them as much time as I think they deserve and they think they deserve. But I try really hard at striking that balance.

Q: Do you have any qualms or fears about job security?

Payne: Well, as I said before, I certainly that the resources we have are getting more and more scarce, and somebody's going to have to be around to help us manage those resources better to maximize their potential. And I can't think of a better group to do that than engineers. But I'm a little biased.

Q: I want to ask you a little more about balancing work and family.

Payne: I'm one of these people that a lot of people hate and dislike, I'm an early riser. So a lot of my balance comes that if I've got things to do that I know are going to take me longer than a typical eight or nine hour day, then I get up and go in really early. When I have a long day ahead, and I know it's going to take me more than eight hours to get it done -- I'm a pretty early riser. It's easier for me to get up early in the morning, go in to work, and get those things done, and spend time with my family in the evening than it is for me to wait till they go to be and then work into the wee hours of the -- of the morning. Others, I know, that I work with, are just the opposite. They're not morning people so they do the reverse and take care of business after everybody's gone to bed at night.

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Q: Actually, let's talk about money. Why did you choose to work in industry as opposed to say, academia or government or anything like that?

Payne: I originally went to school with the full intention of going all the way through and getting a Ph.D. and moving into academia. And I got a little tired of school after going for five years as an undergraduate, and two years as graduate student. So I finished with my masters. And at some point I may go back. I really have the thirst and the desire to teach. I looked at going into academia and originally went to grad school with that intention, but kind of got a little burnt out on school and I think eventually I will go back and do that. But I chose industry or consulting as opposed to government work because, in my opinion, the -- the consultants get the more interesting work. Government work tends to be -- we do it the way the guy before you did it, and the guy before you did it, and the guy before them. And there's a lot of history there and they're not necessarily on the cutting edge. There's nothing wrong with that, but that's not exciting to me. It's exciting to be on the cutting edge and doing things that no everybody's doing.

Q: So how do you get there? Where do you go from here?

Payne: Well, in the State of Texas, to get a state license, they're playing with the fact of you having to have so many continuing education hours a year to keep your license up to day. They count things like the ASCE conventions as continuing education. Monday we'll have seminars, technical seminars and papers from all over the state. The section does put on continuing education classes and new computer models and things like that.

Q: Was it important to you to stay in Texas?

Payne: It was important for -- my wife and I decided after graduation from A&M, an undergraduate -- I was going to go to grad school and we decided we'd go off and specifically targeted graduate schools in the North and East and Northwest to try and see what other parts of the world were like, with the full intention of coming back to Texas. And we were fortunate enough to both find jobs in Austin and move back to Texas -- just before our first child was born, so he didn't have live the fact that he was born in the Northeast -- he was a Texan.

Q: How did you go about picking a graduate school?

Payne: My wife and I decided that we were young and didn't have children yet, and wanted to experience a different part of the country and so we moved to -- I targeted graduate schools in the North, primarily, and ended up going to Cornell University in upstate New York.

Q: What degree did you get there?

Payne: I got a master's of science in civil and environmental engineering, but especially in water resources and environmental systems analysis. A big, long title.

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